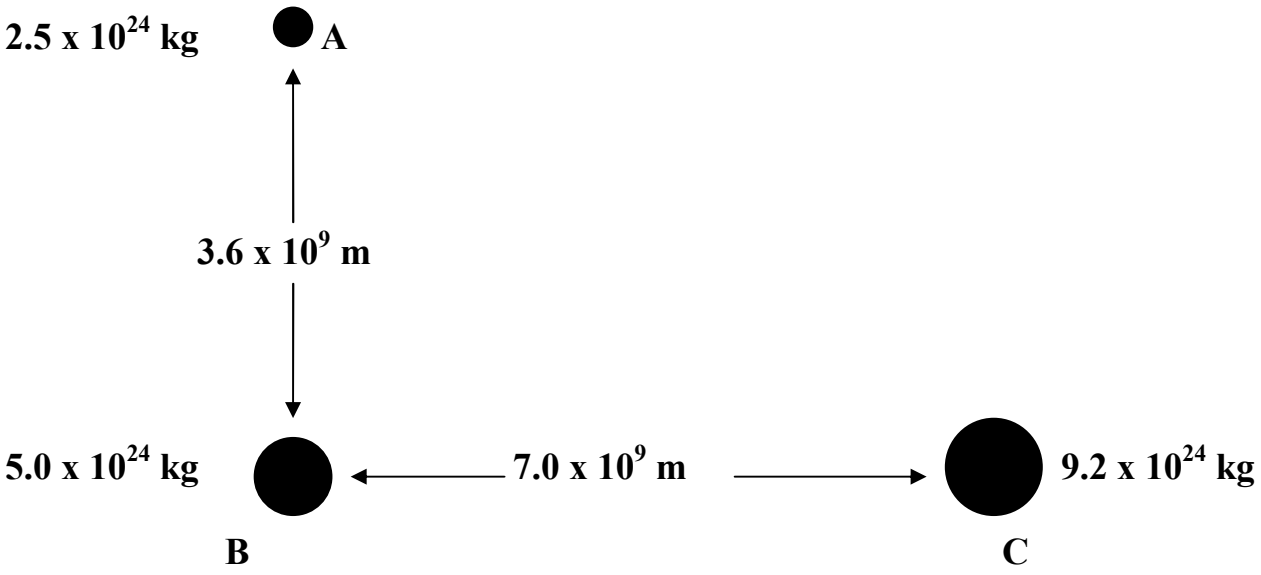
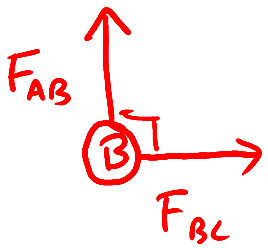
Example 4: Determine the net force acting on Planet B by the other two planets, as illustrated below:

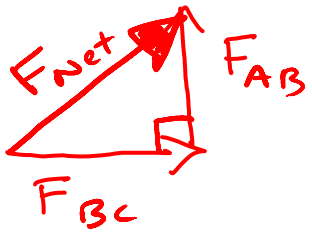


F. b. d. of "B":



$\Rightarrow$

Vector-add to find net grav. force on "B":



Use $F_g = \frac{GMm}{r^2}$ to find each force:

$$F_{AB} = \frac{(6.67\times10^{-11})(2.5\times10^{24})(5\times10^{24})}{(3.6\times10^{9})^2}$$

$$= 6.43\times10^{19}\ N$$

$$F_{BC} = \frac{(6.67\times10^{-11})(5\times10^{24})(9.2\times10^{24})}{(7\times10^{9})^2}$$

$$= 6.26\times10^{19}\ N$$

Use pythagoras and $\tan^{-1}\theta$ to get

$$F_{Net} = 9.0\times10^{19}\ N,\ 46^\circ \text{ up from line BC}$$